

Examination of Decision Factors in the Process of Buying Kitchen Furniture Using Conjoint Analysis

Ispitivanje činitelja u procesu donošenja odluke o kupnji kuhinjskog namještaja primjenom združene analize

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ABSTRACT • *The aim of this research was to determine the relative importance of three factors relevant for buying wooden kitchen furniture in Croatia and Slovenia. A survey was made of 172 potential kitchen buyers: 138 in person at two largest furniture stores in Croatia and Slovenia, and 34 online. A conjoint analysis revealed that respondents were more concerned about the manufacturer and design than the price of the kitchen furniture. For all demographic groups, the lower price kitchen furniture was preferable. Only three demographic groups (35-45 years of age, elementary school or less, and unemployed) preferred the classic kitchen furniture design, while all other groups preferred the modern design. For the manufacturer, differences were found among most socio-demographic categories.*

Key words: *kitchen furniture, buying decision process, conjoint analysis*

SAŽETAK • *U ovom je istraživanju ispitivana važnost triju činitelja bitnih za proces kupnje kuhinjskog namještaja. Istraživanje je provedeno u Hrvatskoj i Sloveniji, a u istraživanju su sudjelovala 172 potencijalna kupca kuhinjskog namještaja. Sto trideset i osam ispitanika u istraživanju je sudjelovalo izravno, i to u dvjema najvećim trgovačkim kućama namještaja u Hrvatskoj i Sloveniji, dok su 34 ispitanika u istraživanju sudjelovala putem interneta (online). Conjoint analiza pokazala je da kupci kuhinjskog namještaja više pozornosti pri kupnji pridaju proizvođačima kuhinja i dizajnu nego cijeni kuhinjskog namještaja. Rezultati su pokazali, da je niža cijena činitelj kojemu sve demografske skupine ispitanika daju prednost pri kupnji. Samo tri demografske skupine ispitanika (nezaposlene osobe, osobe niže i srednjoškolske razine obrazovanja te one u dobi od 35 do 45 godina) pokazale su veću sklonost kupnji kuhinjskog namještaja klasičnog dizajna, dok su ostale skupine ispitanika sklonije kupnji kuhinjskog namještaja modernog dizajna. Za činitelj "proizvođač kuhinjskog namještaja" nisu utvrđene razlike među sociodemografskim kategorijama ispitanika.*

Ključne riječi: *kuhinjski namještaj, odluka o kupnji, conjoint analiza*

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1 INTRODUCTION

1. UVOD

It is generally accepted that socioeconomic development greatly depends on investment and, therefore, long-term development can only be achieved through investment, because well targeted investment activity is the primary assumption for all aspects of competitiveness (Ojurović *et al.*, 2013). Furniture companies are facing strong competition in the contemporary global market. They must continually strive to improve or at least maintain their market share. Consumers are nowadays very demanding and they require as much as possible information about the product to be sure about its quality (Oblak and Glavonjić, 2014). Therefore, all producers are forced to continually revise their marketing and production strategies to satisfy the customer and to ease his/her buying decision. To meet these goals, companies must take interest in customer's desires, perceptions and predispositions and use this information to develop more successful products, search for new marketing channels, to determine appropriate prices and create more effective marketing communication.

1.1 The buying process

1.1. Proces kupnje

Marketers must be familiar with the buying decision process to be able to understand customer demands. There is a sequence of stages buyers pass through when they decide which article to buy. A number of factors influence this process; most important among these are motivation, social and environmental demands, and the company's marketing activities. The buying process starts long before the actual purchase takes place and continues for an extended period afterward. Throughout the course of the process, buyers pass through five stages: problem recognition, information search, evaluation of alternatives, purchase decision and post-purchase behavior (Figure 1).

To effectively analyze the buying process, the buyer's activities before and after the purchase must be examined, as well as the customer's reasoning at the time of purchase. Understanding the buying decision process in the furniture market enables furniture companies to influence the customers at each phase of the process. The company can influence the decision or even change it, if it understands how the customer reaches his/her buying decisions, if it is familiar with the factors influencing customer behavior and if it knows how to convince the customer that his/her best choice is exactly the product the company is offering.

1.2 Previous research

1.2. Prethodna istraživanja

Previous research (Spies, 1996; Jelačić *et al.*, 2010; Oblak and Jošt, 2011; Jelačić *et al.*, 2012; Paluš *et al.*, 2012; Kitek Kuzman *et al.*, 2012; Parobek *et al.*, 2014) about the promotion of wood products and research into how to influence the buying decision process when buying furniture shows that it is crucial for furniture companies to understand the buying decision process. The company must establish how the customers will behave at each stage and determine the factors the company can use to influence the customers at each stage.

Any furniture company that is driven by the needs and wants of consumers has to understand consumer behavior. In many cases, consumers might not even be aware of their motivations or behaviors. Understanding consumer behavior is essential for the success of any organization. Furniture companies must understand consumer wishes, inclinations and behavior in order to generate products that will be accepted and purchased. It is, therefore, necessary to know the factors that are most decisively influencing the buying decision-making.

1.3 Conjoint analysis

1.3. Conjoint analiza

Furniture manufacturers are constantly developing new products and consider several factors during the product design. They perform various analyses in order to yield better sales results. Classical research methods usually do not provide the desired results, since they are unreliable for establishing customer's needs. The reason for inaccurate outcomes of such analysis lies in the fact that research usually focuses on each decision factor separately and, therefore, overlooks various circumstances of the buying process, most significantly the interdependencies and interactions between influencing factors.

The conjoint analysis is often used in marketing research and is by far the most often employed research method for marketing use with regard to the customer's needs (Anderson and Hansen, 2004; Green *et al.*, 2001; Bryan Evans, 2008; Orme, 2010; Zadnik Stirn, 1998; Gustafsson *et al.*, 2001; Praznik *et al.*, 2014; Grošelj *et al.*, 2014). Green and Srinivasan (1990) report that in the early 1980s conjoint analysis was used for the examination of more than 400 commercial cases. Conjoint analysis enables researchers to explain how people decide between products and services, allowing companies to design new products or services



Figure 1 Five Stage Model of the Buying Decision Process (Kotler *et al.*, 2007)

Slika 1. Model pet koraka u procesu donošenja odluke o kupnji proizvoda (Kotler i dr., 2007.)

that fulfill the core needs of the consumers. It is an exceptionally powerful tool for determining which product attributes drive people to buy a specific product and what the consumer actually values in a specific product (Dobney, 2012). Conjoint analysis is superior to other methods for determining consumer preferences, since other methods evaluate consumer preferences for each product attribute individually, while the conjoint analysis takes a more holistic view of the product. In conjoint analysis, each product is defined by a selection of attributes, and then the relative importance of each attribute is determined based on the respondents rating of the product. The consumer gives his/her preference to a specific selection of attributes as an evaluation of the whole product. This approach reflects the consumers' real life situation more closely than examining individual product attributes (Cestre and Darmon, 1997).

1.4 Objectives

1.4. Ciljevi istraživanja

The objectives of this study were to determine buyer preferences regarding three aspects of wooden kitchen furniture: manufacturer type, price level, and design. Potential kitchen buyers were surveyed at two largest kitchen retailers in Croatia and Slovenia, and online. A conjoint analysis of the completed questionnaires is discussed below.

2 MATERIALS AND METHODS

2. MATERIJALI I METODE

To assess the research question, "What kind of kitchen furniture would the buyers prefer?" the following phases were used:

1. concept planning (factor and level determination, choosing the model and concept design),
2. survey design
3. data collection,
4. evaluation of the conjoint model, and interpretation of the results

2.1. Concept planning

2.1. Planiranje koncepta

We determined the number of factors and their levels that best represent common attributes that buyers consider when choosing kitchen furniture. We investigated the product manufacturer, price of wood used for the kitchen, and product design (Table 1).

There are many kitchen brands on the market, here covered by the factor 'Manufacturer'. This factor

was then divided into three levels: Domestic, Foreign and Carpenter (custom made). In regard to the factor 'Price', only the wooden parts of the kitchen were included in the study. Although kitchen appliances can be included along with the purchase of a kitchen, they were not considered in our research, since appliances were beyond the scope of this study. With these constraints, the average price of € 4,000 was determined for the wooden part of the kitchen. In practice, the price for a kitchen is calculated by length. However, respondents were instructed to disregard space concerns when considering the price. In this manner, the respondents were placed in a situation where they had to decide how much they were willing to spend on new cabinets for the kitchen and not how much space they had in their apartment. It was assumed that a lower price represented higher relative utility to the buyer than a higher price. Therefore, we used a linear relationship: $u(\text{lower price}) > u(\text{higher price})$. Since the design, or style, is subject to personal interpretation, we collected images of individual styles and presented them to the respondents in order to assure consistent evaluation. The 'Classic' kitchen differs from the 'Modern' one with regard to the material used and the design aesthetic. In the 'Classic' kitchen, wood and stone are mostly used in natural colors, and rounded elements. They provide a homely, comfortable feeling and a sort of country mood. Their design is timeless. The 'Modern' kitchen is characterized by a minimalist appearance. Various materials are used, like glass, metal, plastic, laminated timber and straight lines. Typical are large drawers that have replaced cabinets with shelves common in the 'Classic' design. The 'Rustic' kitchen features typical furniture with vintage form and appearance. The main materials are natural – wood being one of the primary materials for construction and interior equipment. The 'Design' factor had a neutral relative utility value. Accordingly, we also used the discrete relationship (1).

2.2 Survey and questionnaire design

2.2. Dizajniranje (izrada) anketnog upitnika

With the selected factors and their levels, 18 different combinations or kitchen profiles can be formed. We used the method of simultaneous evaluation of all factor combinations (full profile, or factorial design). Therefore, our questionnaire contained instructions, descriptions of all 18 kitchen profiles, and questions about the respondent's socio-demographic status including age, education, household income, place of

Table 1 Factors and levels

Tablica 1. Faktori i razine

Factor Činitelj	Manufacturer / Proizvođač	Price / Cijena	Design / Dizajn
Level 1 razina 1.	Domestic / domaći	Less than € 4,000 / manje od 4000 EUR	Classic – Standard klasični – standardni
Level 2 razina 2.	Foreign / inozemni	More than € 4,000 / više od 4000 EUR	Modern – Trendy / moderni
Level 3 razina 3.	Carpenter (Custom) / po narudžbi	-	Rustic / rustikalni

residence, gender and employment status. The survey was to be conducted by distributing the questionnaire in person at two largest furniture manufacturers in Croatia and Slovenia. Additionally, the questionnaire was available online for individuals to complete at home. Thus a convenience sample of potential kitchen buyers was obtained. For our analysis, data were collected by survey using a convenience sample of potential kitchen buyers at two largest furniture stores in Croatia and Slovenia; locations where potential kitchen buyers were likely to be encountered. We also published our contact information and the fact that we were conducting a survey about the factors influencing kitchen purchasing on two online forums, inviting Internet users to participate in the survey. The data were processed using the IBM SPSS Statistics 20 and MS Excel 2003 computer programs.

2.3 Evaluation and conjoint analysis

2.3. Procjena i conjoint analiza

In this study, we established a discrete relationship between the levels of each factor, and calculated the relative utility of each factor level as in Hair *et al.* (1998) using the IBM SPSS statistical software program (IBM SPSS, 2011). Further, we used the linear (additive) rule (Hair *et al.*, 1998), which assumes that the utility of an entire product is equal to the sum of the utilities of each studied aspect of the product, including a constant. In our study, the aspects are the chosen factors, and the total utility can be expressed as (Eq. 1):

$$\text{Total product utility} = \text{constant} + \text{utility of manufacture} + \text{utility of price} + \text{utility of design} \quad (1)$$

The importance of each factor (I_j) is the difference between the maximum (\max_{jk}) and minimum (\min_{jk}) utilities for the factor's levels (Eq. 2):

$$I_j = \max_{jk} - \min_{jk} \quad (2)$$

The relative importance of each factor amongst the others (A_j) is the normalized importance of each factor, divided by the sum of the importance for each factor (Eq. 3). The sum of the relative importance values for all factors is 1, and often expressed as a percentage.

$$A_j = \frac{I_j}{\sum_{j=1}^p I_j} \quad (3)$$

Table 2 Factor and level utility estimates

Tablica 2. Činitelji i procjena razine usluge

Factor / Činitelj	Level / Razina	Utility Estimate Procjena usluge	Standard Error Standardna pogreška
Manufacturer proizvođač	Domestic / domaći	0.562	0.158
	Foreign / inozemni	-1.081	0.158
	Carpenter (custom) / po narudžbi	0.519	0.158
Price / cijena	Less than € 4.000 / manje od 4000 EUR	-1.700	0.223
	More than € 4.000 / više od 4000EUR	-3.401	0.446
Design / dizajn	Modern (trendy) / moderan	1.669	0.158
	Classic (standard) / klasičan	0.676	0.158
	Rustic / rustikalan	-2.345	0.158
(Constant) / (konstanta)		12.050	0.352

3 RESULTS AND DISCUSSION

3. REZULTATI I RASPRAVA

3.1 Basic participants' data

3.1. Opći podatci o ispitanicima

There were two ways for the participants to fill out the survey questionnaire:

- in person: participants filled out 138 questionnaires
- on the forum: we received 34 correctly filled out questionnaires.

Therefore, we had a total of 172 participating respondents, 116 female and 56 male. The majority (58 %) were under 30 years of age, which is a representative sample, since young people are likely to buy new kitchens when furnishing their new homes. 52 % of the respondents said they intended to buy a new kitchen in the following year. The high percentage of likely buyers was mostly due to the choice of the place of data collection.

2.2 Conjoint analysis of kitchen properties in the buying decision process by socio-demographic characteristics

2.2. Conjoint analiza kupaca kuhinja prema njihovim sociodemografskim karakteristikama u procesu odluke o kupnji

2.2.1 Utility estimates

2.1.1. Procjena usluge

The utility estimates and standard errors for each factor level are presented in Table 2. The assumption of a discrete relationship between levels for the factors 'Manufacturer' and 'Design' means that higher partial utilities correlate to higher preference. However, because of the linear relationship assumed between price levels, an inverse relationship between utility scores for the factor levels 'Price' was found. In this case, the more negative utility estimate correlates to lower preference. The inverse relationship is the result of the linear correlation for the price and the assumption that a lower price represents a higher utility for the buyer than a higher price.

In general, these results reveal that respondents generally prefer domestic or craftsman kitchen furniture to foreign made kitchen furniture. As expected, respondents preferred lower priced kitchen furniture. The modern designs presented were greatly preferred over rustic designs, with classical designs falling between the other types.

2.1.2 Kitchen profile preference

2.1.2. Sklonosti kupaca tipovima kuhinja

Aggregating the partial utilities for each kitchen profile provides a means to compare preference for different kitchen profiles. Joining the partial utilities, as in Equation 1, the total utility of each kitchen profile presented can be computed. For example, the total utility of a kitchen manufactured in Croatia or Slovenia in the modern style for less than € 4,000 is calculated by adding the partial utility of each factor level, plus a constant. For complete kitchen profile results, we used data from Table 2.

Example:

Total utility »kitchen 1« (manufacturer: domestic, price: less than € 4,000, design: modern) = constant + utility of manufacture + utility of price + utility of design = constant + partial utility - manufacturer (domestic) + partial utility - price (less than € 4,000) + partial utility - design (modern) = 12.050 + 0.562 + (-1.700) + 1.669 = 12.581

Analysis of the total utilities for all 18 kitchens revealed that "Kitchen 1" was the most preferred. The least preferred combination had a foreign manufacturer, cost more than € 4,000 and had a rustic design. The constant in the model represents the "average rank" of all ranks. The range of partial utilities (highest to lowest utility) for each factor represents the importance of the factor in regard to the total preference. The factor with a wider partial utilities range plays a stronger role in purchasing decisions than the factor with a narrower range. The factors have the following relative values of importance (according to Eq. 3): Design 44 %, Manufacturer 31 % and Price 25 %. From this, it can be concluded that kitchen design is the most important attribute for the respondents, while price is the least

important. The value of Person's R coefficient is 0,983 and the value of Kendall's tau coefficient is 0,935. They provide measures of the correlation between the observed and estimated preferences. They show the size and direction of the correlation and the suitability of the model used.

2.1.3 Socio-demographic preferences

2.1.3 Sociodemografske sklonosti

The socio-demographic characteristics included in the questionnaire reveal several interesting preferences within each category. We considered it neither necessary nor appropriate to combine individual demographic characteristics, since the small sample size could lead to unreliable data. We assumed that the chosen factors (Price, Manufacturer and Design) were statistically significantly related to the chosen socio-demographic attributes. Opinions regarding manufacturer varied between groups. The groups 'Female', 'Above 45 years', 'Gymnasium or vocational school', 'Employed', 'Retired', income 'Below € 1,000' and income 'Above € 2,000' as well as living 'In city' and 'In countryside' would choose a domestic manufacturer. Only the group 'Elementary school or less' would choose a foreign manufacturer. The groups 'Male', 'Under 35 years' and '35 to 45 years', 'College or University', 'Unemployed', 'Pupil or student' and income of '€ 1,000 to € 2,000' preferred the carpenter manufacturer option.

All groups would prefer to pay less than € 4,000 for the wooden parts of the kitchen. This is mostly due to the fact that the respondents had the choice of all possible combinations. It is logical that, for example, everyone would rather buy a kitchen from domestic manufacturer with classic design that costs less than € 4,000 than a kitchen from domestic manufacturer with

Table 3 Total utility for each kitchen profile, in descending order of customer preference (greatest utility on top). All total utility scores also include an additional constant (12,050)

Tablica 3. Ukupna razina usluga za tipove kuhinja prema sklonostima kupaca (silaznim redoslijedom: najviša je razina usluge prva u nizu). Svi rezultati ukupne razine usluge obuhvaćaju i dodatnu konstantu.

Manufacturer <i>Proizvođač</i>	Price <i>Cijena</i>	Design <i>Dizajn</i>	Kitchen utility <i>Korisnost kuhinje</i>
Domestic / <i>domaći</i>	Less than € 4,000 / <i>manje of 4000 EUR</i>	Modern / <i>moderan</i>	12.581
Domestic / <i>domaći</i>	Less than € 4,000 / <i>manje of 4000 EUR</i>	Classic / <i>klasičan</i>	11.588
Domestic / <i>domaći</i>	Less than € 4,000 / <i>manje of 4000 EUR</i>	Rustic / <i>rustikalan</i>	8.567
Domestic / <i>domaći</i>	More than € 4,000 / <i>više od 4000 EUR</i>	Modern / <i>moderan</i>	10.880
Domestic / <i>domaći</i>	More than € 4,000 / <i>više od 4000 EUR</i>	Classic / <i>klasičan</i>	9.887
Domestic / <i>domaći</i>	More than € 4,000 / <i>više od 4000 EUR</i>	Rustic / <i>rustikalan</i>	6.886
Foreign / <i>inozemni</i>	Less than € 4,000 / <i>manje of 4000 EUR</i>	Modern / <i>moderan</i>	10.938
Foreign / <i>inozemni</i>	Less than € 4,000 / <i>manje of 4000 EUR</i>	Classic / <i>klasičan</i>	9.945
Foreign / <i>inozemni</i>	Less than € 4,000 / <i>manje of 4000 EUR</i>	Rustic / <i>rustikalan</i>	6.924
Foreign / <i>inozemni</i>	More than € 4,000 / <i>više od .000 EUR</i>	Modern / <i>moderan</i>	9.237
Foreign / <i>inozemni</i>	More than € 4,000 / <i>više od 4000 EUR</i>	Classic / <i>klasičan</i>	8.244
Foreign / <i>inozemni</i>	More than € 4,000 / <i>više od 4000 EUR</i>	Rustic / <i>rustikalan</i>	5.223
Carpenter / <i>po narudžbi</i>	Less than € 4,000 / <i>manje of 4000 EUR</i>	Modern / <i>moderan</i>	12.538
Carpenter / <i>po narudžbi</i>	Less than € 4,000 / <i>manje of 4000 EUR</i>	Classic / <i>Klasičan</i>	11.545
Carpenter / <i>po narudžbi</i>	Less than € 4,000 / <i>manje of 4000 EUR</i>	Rustic / <i>Rustikalan</i>	8.524
Carpenter / <i>po narudžbi</i>	More than € 4,000 / <i>više od 4000 EUR</i>	Modern / <i>Moderan</i>	10.837
Carpenter / <i>po narudžbi</i>	More than € 4,000 / <i>više od 4000 EUR</i>	Classic / <i>Klasičan</i>	9.844
Carpenter / <i>po narudžbi</i>	More than € 4,000 / <i>više od 4000 EUR</i>	Rustic / <i>Rustikalan</i>	6.823

classic design that costs more than € 4,000. In regards to kitchen design, the analysis shows that the buyers in general prefer the modern design option. Only the groups '35 to 45 years', 'Only elementary school or less' and 'Unemployed' would prefer the classic design. The rustic design is the least preferred of all design options.

We can confirm our assumption that the factors (Manufacturer, Price and Design) and their levels are associated to the socio-demographic characteristics, since we achieved significantly related results. For example, men would prefer to buy a custom made kitchen by a carpenter while women would prefer a kitchen from a domestic manufacturer. Additionally, people with an income below € 1,000 greatly prefer a kitchen priced below € 4,000.

4 CONCLUSION

4. ZAKLJUČAK

Competitiveness in the furniture market is an important reason for performing consumer preference research and analysis. Companies use research to stay current with the latest trends. However, furniture manufacturers most often perform customer satisfaction analyses after the purchase. Very few of them decide to perform a research before designing and producing the furniture. This study used conjoint analysis to analyze customer preferences for three different kitchen furniture factors: manufacturer, design and price. The results demonstrated the suitability of conjoint analysis for analyzing customer purchasing behavior, even though it is somewhat more complicated as it requires defining the factors of interest as well as their levels and performing surveys, compared to the other simpler methods (descriptive statistics, for example). Significantly, though, conjoint analysis allows the researcher to examine multiple aspects of the buying process simultaneously. The customers are placed in a realistic buying situation, since they compare and evaluate a spectrum of kitchen attributes and utilities together, where they rate the importance of each combination. To better reflect the reality of the kitchen purchasing decision process, we should have included more factors and levels, since there are usually many other considerations that influence the purchase of kitchen furniture. Functionality and quality are, for example, very important factors, but they would be hard to define in the way that would allow the respondents to give meaningful answers. We included three factors into our research (price for the wooden parts of the kitchen, design and manufacturer). Using conjoint analysis, we determined that the buyers give most importance to design, followed by manufacturer, and the lowest importance to the price. Based on our experience, the conjoint analysis should be used for investigating the buying process and analyzing the influencing factors.

The small sample size of this study prevents broad generalizations. However, within Croatia and Slovenia, this may be a representative sample because of a relatively small total population of kitchen furniture buyers

and since the respondents were considered highly likely to purchase kitchen furniture in the near future. Additionally, as only two options were given for price and these were presented as "more than" and "less than" an estimated average price, it is difficult to place much significance on the importance of price to respondents, as interpretations of this may have varied widely from a small difference in price to a large difference in price (e.g., € 3,999 and €4,001 vs. € 2,500 and € 5,500). However, despite this restraint, demographic groups preferred the lower price option within the factor "price", even though "price" had the lowest relative importance.

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